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CONTINUE DEVELOPMENT OF A BIOMEDICAL DATABASE ON THE
MEDICAL ASPECTS OF CHEMICAL DEFENSE

ANNUAL REPORT

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SUMMARY

This report documents a one-year period of activities encompassing the further development and maintenance of the automated information system known as the Chemical Agent Retrieval System (CARS) for the U.S. Army Medical Research Institute of Chemical Defense (USAMRICD).

During the period 18 November 1985 through 17 November 1986, Associate Consultants, Inc. (ACI), creator of the prototype system, expanded the database with relevant research articles taken from USAMRICD research reports and CRDEC holdings, medical and scientific libraries within the Washington area, and on-line searches of machine-readable databases containing citations from the worldwide literature. ACI began entry of the results of these searches into the citation-tracking system file (CITES). To assist with automated retrieval of the documents, ACI wrote and tested a modular posting-switching program for expansion and maintenance of the Thesaurus. ACI also initiated a study of the impact upon the contract of acquiring an Army-owned/ACI-located VAX.

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FOREWORD

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I. INTRODUCTION

The summary of activities given in this report is in response to the USAMRICD contract objectives being carried out by ACI. During Contract Year (CY) 1985-86, the work to be completed in the ongoing development of CARS under Contract Number DAMD17-86-C-6083, consisted of the following major accomplishments:

- o Document acquisition and processing activities expanded the unclassified (U-CARS) database to 6,552 records on-line.
- o Initiated a study of the impact upon the contract of acquiring an Army-owned VAX to relocate the physical residence of the database from the VAX computer clusters at Battelle Columbus Laboratories in Columbus, Ohio, to the offices of ACI for permanent storage.
- o Designed and tested an Automated Citation Tracking System (CITES file) to signal prior duplication when retrieving CARS documents.
- o Designed, Tested, and installed a posting-switching program for the on-line thesaurus.
- o Assisted USAMRICD researchers in assessing toxicology information on G-agents and V-agents. Database users such as the MITRE Corporation were also provided services.

ACI responded fully to the task objectives described in the Contract Award and Proposal. Accordingly, we achieved the following goals:

- o Searched on-line databases, accessed special area libraries for relevant CARS literature, received draft reports from USAMRICD, and implemented search activities at the Defense Technical Information Center (DTIC);
- o Designed and tested an automated citation tracking system for identifying CARS duplicates;
- o Updated CARS training manual for more effective searching and retrieving of chemical agent literature on the CARS database;
- o Developed, analyzed, and codified quality control and quality assurance procedures for securing CARS literature;

- o Facilitated audit of U-CARS and C-CARS data concerning the nature of effects on animals and humans, and the nature of lethality, safe levels, and toxicity related to chronic exposures.
- o Checked research literature within USAMRICD and CRDEC research holdings and added relevant documents to the database.

II. CONTRACT ACTIVITIES

Six major activities were successfully carried out during the 1985-1986 contract year:

- o Database Expansion
- o Data Collection
- o Document Coding/Abstracting
- o Thesaurus Design/Lexicography
- o Keying and Editing
- o Systems Development

Each task is described below with a general introduction followed by a description of activities.

A. Database Expansion

During CY 1986, The scope of the U-CARS database was broadened. CARS users had access to data on pharmacologic, pharmacokinetics, and decremental performance mechanisms that are considered potentially relevant battlefield effects of nerve agent exposure. Inclusive in that to data on performance mechanisms are the following treatment compounds: atropine compounds, HGG compounds, HI compounds, pralidoxime compounds, obidoxime, pyridostigmine, physostigmine, P2S, and TMB-4.

Our biomedical and information scientists also supported efforts by the MITRE Corporation to assess toxicity information on G-agents, V-agents, sulfur mustard, and lewisite, pursuant to MITRE's contract with USAMRICD.

B. Data Collection

The preparation of additional information to be incorporated into CARS involved systematic literature analysis, search and screening procedures. Approximately 12,000 unclassified bibliographic citations were screened by CARS staff. For inclusion into C-CARS, documents were screened at CRDEC Technical Library by C-CARS staff.

Documents to be included in the database covered U-CARS documents that were determined potentially relevant, from which unit records were processed and placed on-line. The literature analysis work involved only the accepted documents from the literature search phase. Overall, literature analysis activities involved an on-line search for CARS literature of the following machine-readable databases:

Eric
Biosis 1981
NTIS
Social Scisearch

Agricola 79
Psycinfo
Chem Ind Notes
Federal Index
Claims/U.S. Patent
Claims/U.S. Patent A
Scisearch 84
Dissertation Abstracts
Enviroline
Pollution ABS
Pharm News Index
Niche
Magazine Index
Pais International
Cris/USEA
SSIE Current Research
GPO Monthly CAT
Enviro Perio Bib
Intl Pharm ABS
Life Sciences Collection
Conf Papers Index
PTS A/DM&T
Scisearch 81-81
USPSD
Scisearch 78-80
CIS
Agricola 70-78
National Newspaper
Claims/US PAT ABS
Congressional Record
Federal Register
Chemical Exposure
Psycalert
Current Technology
Health Planning
Medline 1966-1974
Medline 1975-1979
Medline 1980
Occupational Safety
World Affairs Report
Scisearch 74-77
Agris
Newsearch
Nursing and Allied
Middle East: Abstract
Mideast File
Federal Research In Progress
De Haan Drug Data
Soviet Science
CA Search 67-71
CA Search 72-76
CA Search 80-81

CA Search 82
Chemical Business
World Patents Index
World Patents Index
Remarc 1900-1939
Remarc 1940-1959
Remarc 1960-1969
Remarc 1970+
LC Marc
LC Marc
Book in Print
Wiley Catalog Online
PTS MARS

Access to potentially relevant CARS literature was provided by the following libraries:

- o National Library of Medicine
- o National Institutes of Health Library
- o U.S. Department of Agriculture Library
- o Welch Medical Library of John Hopkins University
- o U.S. Library of Congress
- o USAMRICD and CRDEC research libraries

CARS staff also received, processed, and included draft annual reports from USAMRICD personnel.

C. Document Coding/Abstracting

Scientific and bibliographic data from relevant CARS documents were abstracted, coded, indexed, and placed on-line during CY 1986. Seminars for abstractors were held periodically by ACI project management, to ensure continuing accuracy and comprehensiveness of data being entered into CARS.

D. Thesaurus Design/Lexicography

ACI collaborates extensively with internationally-recognized lexicographers to enhance analysis of the complex subject material in the CARS database. The experience of six years of detailed indexing has yielded a rich vocabulary well-adapted to the contents of the database and needs of the users.

Expansion of the CARS database consisted of a sequence of tasks which were refined throughout the project. Completion of the CARS thesaurus structure and database expansion significantly altered indexing guidelines. A posting/switching program was developed to permit revisions to existing thesaurus terms.

E. Keying and Editing

During the past year, ACI data entry and editing staff developed a work plan to begin entering citations into the Automated Citation Tracking System (CITES) file. Also, the CARS Training Workshop Manual was revised by updating information and making format changes.

F. Systems Development

ACI proposed an Army-owned/ACI-located VAX 11/750 to house the CARS database. This proposal stemmed from an Army interest in funding ACI's proposal to acquire a VAX and move the database from its current site, Battelle Columbus Laboratories, to a site that will offer both classified ADP and lower ADP costs. No decision was made by the Army this year.

III. CONCLUSIONS AND RECOMMENDATIONS

The CARS database has been expanded to support an increase in CARS users, and to enhance USAMRICD's research capability. Actual progress made by ACI in the ongoing development of CARS will facilitate an evaluation by the ongoing development of CARS will facilitate an evaluation by the Army as called for in the Contract Award and Proposal.

Upcoming activities to improve the quality and effectiveness of the CARS database in achieving the stated goals of the USAMRICD include:

- o Scientific support for research, testing and evaluation of medical material and treatments for chemical threat agents;
- o Including literature generated by USAMRICD researchers;
- o Developing antidotes and pretreatment compounds for chemical defense;
- o A centralized biomedical information system to identify significant scientific data gaps;

We recommend that USAMRICD grant final approval to ACI to purchase and install VAX hardware at ACI for classified ADP in order to lower ADP costs. The VAX acquisition plan is pending response from the Army.

IV. GLOSSARY

Abstract	In CARS, a detailed summary (up to 800 words) of the information content and data contained with a technical document.
BASIS	The database management system (DBMS) used to manipulate the CARS database.
C-CARS	The portion of the CARS database containing only classified documents.
Clusters	A group of similar elements or terms gathered or occurring closely together.
Codify	To arrange or systematize.
Coding	The process of filling in work sheets containing a map of the CARS unit record so data can be entered into CARS.
Dbase III+	A database management system software application to be used on IBM PC compatible.
Decremental	The amount lost by gradual diminution or waste.
DEC	Digital Equipment Corporation.
Downloading	The process of transmitting data from the last computer to the remote computer.
Facets	An aspect; phase.
Field	In computer memory, a collection of bytes suitable for storing a specific item of data.
Hierarchies	A body of terms organized or classified according to rank or authority.
Index Term	One or more words defining a subject area discussed in a document; member of the subject word list produced by BASIS or data within a CARS index term field.
Lexicography	Process of wiring or compiling a dictionary.
Off-Line	An operation performed to prepare data to be entered into a computer.

On-Line	An operation in which data entered from a terminal is immediately processed to alter the contents of a record stored on disk.
Record	In computer memory, a collection of fields in fixed order, repeated one or more times, suitable for storage of specific data elements.
Retrieval	Process of obtaining all bibliographic documents within a collection that contain certain data as specified by the search strategy.
Search	Process of identifying bibliographic citations.
Thesaurus	A controlled vocabulary showing logical inter-relationships of all index terms.
U-CARS	The portion of the CARS database containing only unclassified documents
Unit Record	The computer-coded set of all data elements pertaining to a given CARS document,
Update	Addition of new records to the computerized database.
Uploading	The process of transmitting data from a remote computer to a host computer.
User	A researcher, administrator, or librarian interested in finding specific information in the CARS database.
VAX 11/780	DEC computer housing CARS at Battelle Columbus Laboratories.

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